Panasonic

Basic Operating Instructions
Instrucciones básicas de funcionamiento
Wearable Camera
Cámara Portatil

Model No. **HX-A500**

Please read these instructions carefully before using this product, and save this manual for future use.

Lea cuidadosamente estas instrucciones antes de usar este producto, y guarde este manual para usarlo en el futuro.

More detailed operating instructions are available in “Operating Instructions (PDF format)”. To read it, download it from the website.
https://eww.pavc.panasonic.co.jp/hdw/oi/A500/
- Click the desired language.

* You will need Adobe Reader to browse or print the Operating Instructions (PDF format). You can download and install a version of Adobe Reader that you can use with your OS from the following website. (As of April 2014)
http://www.adobe.com/products/acrobat/readstep2.html

Se pueden encontrar instrucciones de funcionamiento más detalladas en “Instrucciones de funcionamiento (formato PDF)”. Para leerlo, descárguelo de la página web.
https://eww.pavc.panasonic.co.jp/hdw/oi/A500/
- Haga clic en el idioma deseado.

* Necesitará Adobe Reader para buscar o imprimir las instrucciones de funcionamiento (formato PDF). Se puede descargar e instalar una versión de Adobe Reader que puede usar con su sistema operativo en la siguiente página web. (A partir de abril de 2014)
http://www.adobe.com/products/acrobat/readstep2.html

microSDHC™ dlna CERTIFIED™ Wi Fi CERTIFIED Wi-Fi PROTECTED SETUP N™

E

SQT0253

Information for Your Safety

WARNING:

To reduce the risk of fire, electric shock or product damage,

- Do not let water or other liquids drip or splash inside the unit.
- Do not expose accessories (battery pack, battery charger, AC adaptor, SD memory card and etc.) to rain, moisture, dripping or splashing.
- Do not place objects filled with liquids, such as vases, on accessories.
- Use only the recommended accessories.
- Do not remove covers.
- Do not repair this unit by yourself. Refer servicing to qualified service personnel.

CAUTION!

To reduce the risk of fire, electric shock or product damage,

- Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure this unit is well ventilated.
- Do not obstruct this unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
- Do not place sources of naked flames, such as lighted candles, on this unit.

This unit is intended for use in moderate climates.

■ EMC Electric and magnetic compatibility

This symbol (CE) is located on the rating plate.

Product Identification Marking is located on the bottom of the unit.

■ Cautions for use

This unit and the microSD card become warm during use. This is not a malfunction.

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, press the reset button.

Do not use this unit near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

About connecting to a PC

- Do not use any other USB cables except the supplied one.

- **Make sure to use the supplied cable.**
- **Do not extend the cable.**
- **Do not spray insecticides or volatile chemicals onto this unit.**
- Do not leave rubber or plastic products in contact with this unit for a long time.
- Before cleaning, pull the USB cable from the PC, and then wipe this unit with a soft, dry cloth.
- Use of benzine, paint thinner, alcohol, or dishwashing liquid may alter the camera body or peel the surface finish. Do not use these solvents.
- Store this unit in a cool place with minimal humidity, and with a constant temperature

where possible (recommended temperature: 15 °C to 25 °C, recommended humidity: 40%RH to 60%RH).
- Always remove the card from this unit.
- When storing this unit for an extended time, it is recommended that you charge it once every year.
- **The battery used in this unit is a rechargeable lithium-ion battery. It is susceptible to humidity and temperature and the effect increases the more the temperature rises or falls.**
- **If the operating time is very short even after the battery has been recharged, the battery has worn out.**
  Consult with your dealer.
- **When the microSD card is being accessed (when is displayed or the access lamp is lit), do not perform the following:**
  – Remove the microSD card
  – Turn the unit off
  – Insert and remove the USB cable
  – Expose the unit to vibrations or shock

■ Disposal of Old Equipment and Batteries

Only for European Union and countries with recycling systems

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points in accordance with your national legislation.
By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.

For more information about collection and recycling, please contact your local municipality.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

Note for the battery symbol (bottom symbol):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

CE

Declaration of Conformity (DoC)
Hereby, *"Panasonic Corporation"* declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Customers can download a copy of the original DoC to our R&TTE products from our DoC server:
http://www.doc.panasonic.de
Contact to Authorized Representative:
Panasonic Marketing Europe GmbH,
Panasonic Testing Centre, Winsbergring 15,
22525 Hamburg, Germany

This product is intended for general consumer. (Category 3)
This product on purpose to connect to access point of 2.4 GHz WLAN.

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For United Kingdom and Ireland customers

■ Sales and Support Information

Customer Communications Centre

- For customers within the UK: 0844 844 3899
- For customers within Ireland: 01 289 8333
- Monday–Friday 9:00 am – 5:00 pm (Excluding public holidays).
- For further support on your product, please visit our website: www.panasonic.co.uk

Direct Sales at Panasonic UK

- Order accessory and consumable items for your product with ease and confidence by phoning our Customer Communications Centre
  Monday–Friday 9:00 am – 5:00 pm (Excluding public holidays).
- Or go on line through our Internet Accessory ordering application at www.pas-europe.com.
- Most major credit and debit cards accepted.
- All enquiries transactions and distribution facilities are provided directly by Panasonic UK.
- It couldn’t be simpler!
- Also available through our Internet is direct shopping for a wide range of finished products. Take a browse on our website for further details.

(Important) About the Waterproof/ Dustproof

Waterproof/Dustproof Performance

This unit's waterproof/dustproof rating complies with the "IP58" rating. Provided the care and maintenance guidelines described in this document are strictly followed, this unit can operate underwater, to a depth not exceeding 3.0 m for a time not exceeding 30 minutes. *

This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.

* This means that this unit can be used underwater for specified time in specified pressure in accordance with the handling method established by Panasonic.

■ Handling of this unit

- Waterproofing is not guaranteed if the unit is subject to an impact as a result of being hit or dropped etc. If an impact to this unit occurs, it should be inspected (subject to a fee) by a Panasonic's Service Centre to verify that the waterproofing is still effective.
- The waterproof performance may be degraded due to the strong water pressure when this unit is used deeper than 3.0 m underwater.
- When this unit is splashed with detergent, soap, hot spring, bath additive, sun oil, sun screen, chemical, etc., wipe it off immediately.
- Do not rinse with running water, such as tap water.
- Waterproof function of this unit is for sea water and fresh water only.
- Any malfunction caused by customer misuse, or mishandling will not be covered by the warranty.
- Cards are not waterproof. Do not handle with a wet hand. Also, do not insert wet card into this unit.
- Do not open or close the side cover when your hands are wet or water droplets are present on this unit. Failure to do so may lead to damage such as rusty terminals caused by water droplets.
- **Foreign objects may adhere to the inner side of the side cover (around the rubber seal or connecting terminals) when the side cover is opened or closed in places with sand or dust etc. If you close the side cover with foreign objects adhering to it, water may enter the inside. Be very careful because doing so may cause malfunctions.**
- Do not leave this unit for a long period of time in places where temperature is very low (at high altitude etc.) or very high (inside a car under strong sunlight, close to a heater, on the beach, etc.) Waterproof performance may be degraded.
- The inside of this unit is not waterproof. Water leakage will cause malfunction.
- **If any foreign object has adhered to the inner side of the side cover, remove it.**
- **If any liquid such as water droplets has adhered to this unit or inner side of the side cover, wipe off with a soft dry cloth. Do not open or close the side cover near the water, when underwater, using wet hands, or when this unit is wet. It may cause water leakage.**
- The alert sound and shutter sound may be lowered when using this unit. This is for ensuring the waterproof performance of this unit, and not a malfunction. Opening and closing the side cover will restore the original volume.

■ About Condensation (When the lens or the LCD monitor is fogged up)

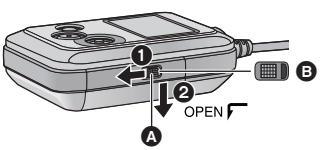
Condensation occurs when there is a change in temperature or humidity, such as when the unit is taken from outside or a cold room to a warm room. Please be careful, as it may cause the lens or LCD monitor to become soiled, moldy, or damaged.
When taking the unit to a place which has a different temperature, if the unit is accustomed to the room temperature of the destination for about one hour, condensation can be prevented. (When the difference in temperature is severe, place the unit in a plastic bag or the like, remove air from the bag, and seal the bag.)
When condensation has occurred, turn the unit off, open the side cover and leave the unit like that for about 2 hours. When the unit becomes accustomed to the surrounding temperature, fogginess will disappear naturally.

Check before using underwater

Do not open or close the side cover in places with sand and dust, close to water, or with wet hands. Sand or dust adhering may cause water leaks.

1 Open the side cover.

❶ **Slide the LOCK switch Ⓐ to the left to unlock the side cover.**
Ⓑ: Unlocked when the red indicator is visible
❷ **Slide the side cover downward to open it.**



2 Check that there are no foreign objects on the inner side of the side cover.

- If there are any foreign objects, such as lint, hair, sand, etc., on the surrounding area, water will leak within a few seconds causing malfunction.

3 If there is foreign matter adhering to the unit, remove it.

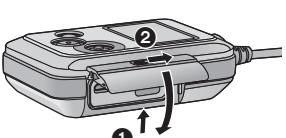
- Be extremely careful to remove any sand etc. that may adhere to the sides and corners of the rubber seal.
- Wipe it off with a dry soft cloth if there is any liquid. It may cause water leaks and malfunction if you use this unit with liquid adhered.

4 Check for cracks and deformation of the rubber seal on the side cover.

- The integrity of the rubber seals may decrease after about 1 year, with use and age. To avoid permanently damaging this unit the seals should be replaced once every two years. Please contact Panasonic's Service Centre for related costs and other information.

5 Close the side cover securely.

❶ **Close the side cover and slide it upward.**
❷ **Slide the LOCK switch to the right to lock the side cover.**
- Lock securely to the points where the red portion of the LOCK switch is no longer visible.
- Securely lock it until it clicks.



- To prevent water seeping into this unit, be careful not to trap foreign objects such as liquids, sand, hair or dust etc.

Using this unit underwater

- Use this unit underwater at a depth of down to 3.0 m with the water temperature between 0 °C and 35 °C.
- Do not use this unit at a depth of over 3.0 m.
- Do not use it in hot water over 35 °C (in a bath or hot spring).
- Do not use this unit underwater not longer than 30 minutes continuously.
- Do not open or close the side cover.
- Do not apply shock to this unit underwater. (Waterproof performance may not be maintained, and there is a chance of water leak.)
- Do not dive into the water holding this unit. Do not use this unit in a location where the water will splash strongly, such as rapid flow or waterfall. (Strong water pressure may be applied, and it may cause malfunction.)
- This unit will sink in the water. Take care not to drop this unit.

Caring for this unit after using it underwater

Do not open or close the side cover until the sand and dust is removed by rinsing the camera with water.

Make sure to clean the camera after using it.

- Thoroughly wipe off any water droplets, sand, and saline matter on your hands, body, hair, etc.
- It is recommended to clean the camera indoors, avoiding places where water spray or sand may fall.

Do not leave this unit uncared for longer than 60 minutes after using it underwater.

- Leaving this unit with foreign objects or saline matter on it may cause damage, discolouration, corrosion, unusual odour, or deterioration of the waterproof performance.

1 Rinse with water with the side cover closed.

- After use at the seaside or underwater, soak the unit in fresh water pooled in a shallow container for about 10 minutes.

2 Drain water by holding this unit and shaking it lightly a few times.

- After using this unit at the seaside or underwater, or after washing it, water will remain at the speaker site or mic site of this unit for a while and it may cause lower sound or sound distortion.
- Pay careful attention to prevent this unit from dropping.

3 Wipe off water drops on this unit with a soft, dry cloth and dry this unit in a shaded area that is well ventilated.

- Dry this unit approx. 1 hour or more.
- Dry this unit on a dry cloth.
- Do not dry this unit with hot air from dryer or similar. It will deteriorate the waterproof performance or cause failure due to deformation.
- Do not use chemicals such as benzine, thinner, alcohol or cleanser, soap or detergents.

4 Confirm that there are no water droplets, open the side cover, and wipe off any water droplets or sand left inside using a soft, dry cloth.

- Water droplets may adhere to the card, etc. when the side cover is opened without thoroughly drying. Also, water may accumulate in the gap around the card slot or the terminal connector. Be sure to wipe any water off with a soft, dry cloth.
- The water droplets may seep into this unit when the side cover is closed while it is still wet, causing condensation or failure.

In case water enters this unit, stop the use and consult your dealer.
Malfunctions resulting from water leakage due to wrong handling by customers are not subject to compensation.

- If the Head Mount is exposed to seawater, rinse off the salt water with fresh water. When the Head Mount is exposed to water, wipe it off with a dry towel or something similar, and dry it thoroughly in the shade.

Read this first

■ About recording formats and compatibility of this unit

- This unit is an MP4 format (MPEG-4 AVC file standard)* Wearable Camera for recording high-definition motion pictures.

* You can record 4K motion pictures ([3840×2160/25p]).

- AVCHD and MPEG2 motion pictures are different formats, and are not therefore supported by this unit.
- Motion pictures recorded with other devices are not supported by this unit.

■ About the portrait rights

Be sure to pay special attention to the privacy, the portrait rights, etc. of the subject when you use this unit. Use it at your own risk.

■ Indemnity about recorded content

Panasonic does not accept any responsibility for damages directly or indirectly due to any type of problems that result in loss of recording or edited content, and does not guarantee any content if recording or editing does not work properly. Likewise, the above also applies in a case where any type of repair is made to this unit.

■ About the “Image App”

Install the smartphone application “Image App” on your smartphone. You can enjoy a variety of functions by setting up a Wi-Fi connection between this unit and a smartphone. (➜ 10)

- For information about the installation of the “Image App”, refer to page 23.

■ Installing HD Writer WE 2.0

Check the website below to download/install the software.
http://panasonic.jp/support/global/cs/soft/download/f_we20.html

■ About the clock setting

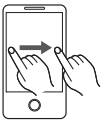
Make sure to set date and time before recording. (➜ 15)

■ For the purposes of these operating instructions

- Pictures may be slightly different from the original.
- Depending on the firmware version you are using, captured screens described in these operating instructions may differ from the actual screens.
- Names, icons, contents and services of applications may be changed with no prior notice. Please note that they may differ from the descriptions of these operating instructions.
- microSD card and microSDHC card are referred to as the “microSD card”.
- Smartphone and tablet computer are referred to as the “smartphone”.
- Pages for reference are indicated by an arrow, for example: ➜ 00

- Smartphone operations are described as follows:

Tap
Touch the screen lightly and release your finger.



Drag
Move your finger while still touching the screen.

Drag and Drop
Move your finger while still touching the screen, and release the finger.

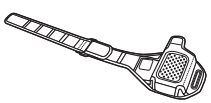
■ Cards that you can use with this unit

microSD Memory Card and microSDHC Memory Card

Accessories

Check the accessories before using this unit.
Keep the accessories out of reach of children to prevent swallowing.
Product numbers correct as of April 2014. These may be subject to change.

Armband Case
SFC0147



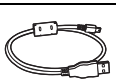
Head Mount (L)*
SYA0004

Head Mount (R)*
SYA0006

Headband
SFC0159

- The Headband comes standard with the Head Mount (R).

USB cable
K2KYYYY00221



* For information on how to assemble the Head Mount, refer to page 19.

Optional accessories

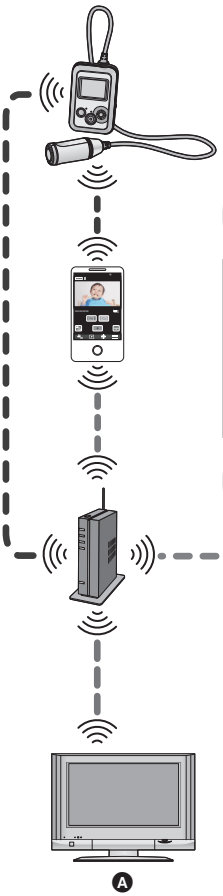
Some optional accessories may not be available in some countries.

Multi Mount (VW-MKA100)
Tripod Mount (VW-CTA100)
Suction Cup Mount (VW-SCA100)*
Wind Jammer (VW-WJA100)
Video Camera Mount (For Handlebar) (RP-CMC10)*
Clip Mount (VW-CLA100)
Multi Case (VW-HLA500)
Multi Belt (VW-MBA100)
Head Mount (VW-HMA100)

* To use the Suction Cup Mount/VW-SCA100 and Video Camera Mount (For Handlebar)/ RP-CMC10, the Tripod Mount/VW-CTA100 is required.

What you can do with this unit

You can enjoy a variety of functions by setting up a Wi-Fi connection between this unit and a smartphone or a wireless access point.



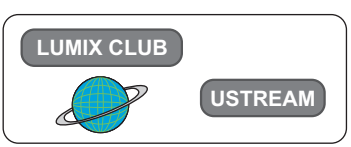
- **Recording motion pictures/still pictures (➜ 21)**
- **Menu settings (➜ 16)**

Wi-Fi Connection with a smartphone

Image App

- **Playback (➜ 22)**
- **Deletion/Copy**
- **Remote operation (➜ 24)**

Wi-Fi Connection with a wireless access point



Live broadcasting
Using the “LUMIX CLUB” and USTREAM services, you can broadcast live motion pictures.

Playback on DLNA-compatible devices
You can play back the contents stored in this unit on the DLNA-compatible TV.

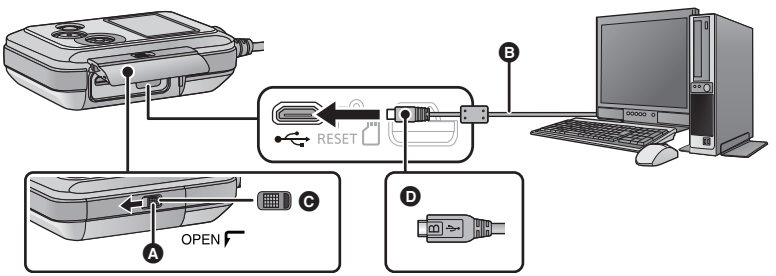
Ⓐ **DLNA-compatible devices**

Power supply

Charging the battery

When this unit is purchased, the battery is not charged. Charge the battery fully before using this unit for the first time.

- **This unit has a built-in rechargeable lithium-ion battery. Do not remove except when disposing of this unit. (➜ 27)**
- **The battery will not be charged if this unit is turned on. Connect it with the PC to charge the battery after turning it off.**
- **It is recommended to charge the battery in a temperature between 10 °C and 30 °C.**



Ⓐ LOCK switch
Ⓑ USB cable (supplied)
Ⓒ Unlocked when the red indicator is visible
Ⓓ Turn the side with the symbol up to connect the micro B end of the USB cable to the USB terminal of this unit.

1 Slide the LOCK switch to the left to unlock the side cover and slide the side cover downward to open it.

2 Connect the USB terminal of this unit to a PC with the USB cable (supplied).

- Insert the USB cable securely all the way.
- The Power lamp will flash red at an interval of 2 seconds (approximately 1 second on, 1 second off), indicating that charging has begun.
  It will turn off when the charging is completed.

- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.)
- Do not heat or expose to flame.
- Do not leave the unit (including built-in battery) in a car exposed to direct sunlight for a long period of time with doors and windows closed.
- If operating time is short even after fully charging the battery, the battery is worn out and needs to be replaced. Please contact your dealer.

- When the PC is in a power saving mode such as a standby state, the battery may not be charged. Cancel the power saving mode, and connect this unit again.
- Operation is not guaranteed when devices are connected through USB hubs or by using extension cables.
- Operation cannot be guaranteed on all devices having a USB terminal.

Charging and recording time

■ Charging/Recording time

- Temperature: 25 °C/humidity: 60%RH

Charging time	Picture size/Frame rate	Maximum continuous recordable time	Actual recordable time
4 h 30 min	[3840×2160/25p]	1 h 25 min	45 min
	[1920×1080/50p]	2 h	1 h
	[1920×1080/25p]	2 h 20 min	1 h 10 min
	[1280×720/50p]	1 h 55 min	1 h
	[1280×720/25p]	2 h 15 min	1 h 10 min
	[848×480/25p]	2 h 20 min	
	[1920×1080/50fps]	2 h 15 min	
	[1280×720/100fps]	2 h 10 min	1 h 5 min
	[848×480/200fps]	2 h 5 min	

- “h” is an abbreviation for hour, “min” for minute and “s” for second.
- These times are approximations.
- **The indicated charging time is for when the battery has been discharged completely. Charging time and recordable time vary depending on the usage conditions such as high/low temperature.**

- The actual recordable time refers to the recordable time when repeatedly starting/stopping recording, turning this unit on/off, etc.
- The power lamp flashes (Flashing with approx. 1 second period (off for approx. 0.5 second, on for approx. 0.5 second)) when the remaining battery time becomes low.
- The main unit heats up after use or charging. This is not a malfunction.
- For information about charging with a mobile USB charger or an AC adaptor, check the support site.
  http://panasonic.jp/support/global/cs/e_cam/index.html
  (This site is English only.)

The mains plug is the disconnecting device. Install this unit so that the mains plug can be unplugged from the socket outlet immediately.

Battery capacity indication

- The display changes as the battery capacity reduces. If the battery discharges, then will flash red.

When the Power lamp is flashing during charging

Flashing with approx. 0.5 second period (off for approx. 0.25 second, on for approx. 0.25 second):
- Check that the USB terminals of this unit or the connecting device, such as PC are not dirty or covered with a foreign object, and reconnect correctly. If a foreign object or dirt is present, turn off this unit before removing.
- The environment is at an extremely high or low temperature. Wait until the temperature has returned to an appropriate level and try charging again. If you are still unable to charge, there may be a fault in this unit or the connecting device.

Flashing with approx. 4 second period (off for approx. 2 seconds, on for approx. 2 seconds):
- When the battery is over discharged or the temperature of the battery is too high or low. It can be charged, but it may take a few hours to complete the charging normally.
- It will flash in approx. 2 second intervals when normal charging resumes. Even in such cases, it may start flashing in approx. 4 second intervals until charging is completed depending on the conditions of use.

Off:
- Charging has finished.

Recording to a card

This unit can record motion pictures or still pictures to a microSD card.

Cards that you can use with this unit

- **To record motion pictures, use a microSD card that supports one of the following SD Speed Class Ratings.**
  If you use a microSD card with an SD Speed Class Rating that does not support the current recording setting, recording may stop suddenly.

Recording settings	Supported SD Speed Class Ratings
When [PIXELS / FRAME RATE] is set to [3840×2160/25p]	Class 10 or higher of the SD Speed Class Rating
When [RECORDING MODE] is set to [SLOW MOTION] (➜ 21)	Class 6 or higher of the SD Speed Class Rating
Settings other than the above	Class 4 or higher of the SD Speed Class Rating

- Please check the latest information on the support website below.
http://panasonic.jp/support/global/cs/e_cam/index.html
(This website is in English only.)

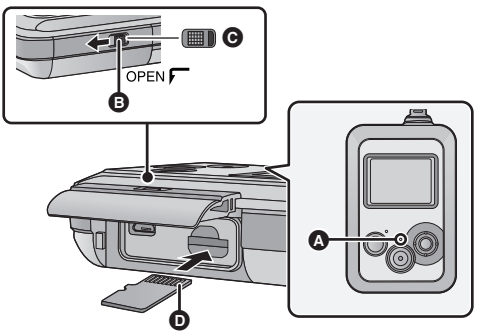
- Operation is not guaranteed for all microSD cards.

- Keep the Memory Card out of reach of children to prevent swallowing.

Inserting/removing a microSD card

When using a microSD card not from Panasonic, or one previously used on other equipment, for the first time on this unit, format the microSD card. (➜ 16) When the microSD card is formatted, all of the recorded data is deleted. Once the data is deleted, it cannot be restored.

Caution:
Check that the access lamp has gone off.



Ⓐ Access lamp
- When this unit is accessing the microSD card (such as recognition, recording, playback and deletion), the access lamp lights up.

Ⓑ LOCK switch
Ⓒ Unlocked when the red indicator is visible

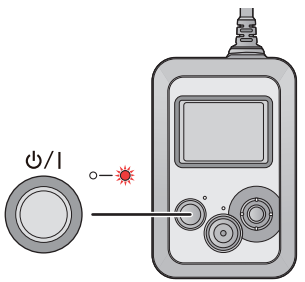
1 **Slide the LOCK switch to the left to unlock the side cover and slide the side cover downward to open it and then insert (remove) the microSD card into (from) the card slot.**
- Face the terminal side Ⓓ upward and press it straight in as far as it will go.
- Press the centre of the microSD card and then pull it straight out.

2 **Close the side cover and slide the LOCK switch to the right to lock it.**
- Close the side cover and slide it upward and then lock it.
- Securely lock it until it clicks.

Turning this unit on/off

Press the power button to turn on this unit.

The power lamp is turned on.



To turn off this unit

Hold down the power button until the power lamp goes off.

Setting date and time

The clock is not set at the time of purchase. Make sure to set the clock.

1 **Press the joystick to select the menu. (➜ 16)**

[SETUP] → [CLOCK SET]

2 **Move the joystick right or left to select the date to be set, then move the joystick up or down to select the desired value.**

- Press the joystick or recording start/stop button to enter the selection.
- The year can be set between 2000 and 2039.

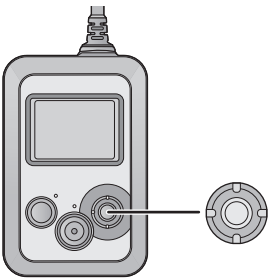
3 **Move the joystick right or left to select the time to be set, then move the joystick up or down to select the desired value.**

- Press the joystick to enter the selection.

4 **Press the recording start/stop button to complete the setting.**

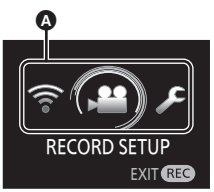
- When the unit is turned on for the first time, a message asking you to set the date and time will appear. Select [YES] and perform Steps 2 to 3 to set the date and time.

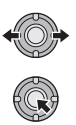
Using the menu screen



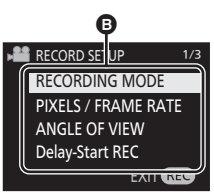
1 **Press the joystick.**

2 **Select the top menu Ⓐ, then press the joystick.**





3 **Select the submenu Ⓑ, then press the joystick.**



4 **Select the desired item, then press the joystick to enter the selection.**

To get back to the previous screen

Move the joystick left.

To exit the menu screen

Press the recording start/stop button.

Language selection

You can select the language on the screen display and the menu screen.

[SETUP] → [LANGUAGE] → desired language

Formatting

Please be aware that if a microSD card is formatted, then all the data recorded on the microSD card will be erased and cannot be restored. Back up important data on a PC, etc.

[SETUP] → [FORMAT MEDIA] → [YES]

- **Do not format a microSD card using any other equipment such as a PC. The card may not be used on this unit.**

Before recording

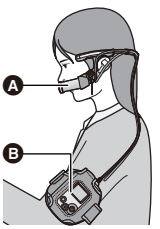
This unit is designed to record images when attached to the Armband Case and the Head Mount.

Wearing this unit

Wear the main unit and camera unit.

- If a feeling of discomfort arises after a long period of use, stop the use or adjust the size of the Head Mount/Armband Case/ Headband to loosen them a little. Please note that the parts may leave marks on your face and other body parts after use.
- For the direction of the camera, check the actual image on the LCD monitor.

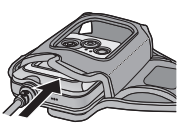
Ⓐ **Camera unit**
Ⓑ **Main unit**



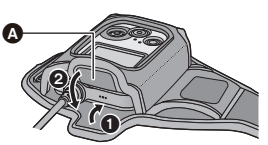
Fastening the main unit using the Armband Case

1 **Insert the main unit so that you can see the buttons on it**

- Make sure to insert the main unit all the way in.

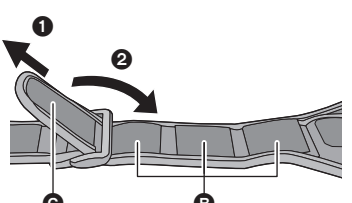


2 **Fasten the main unit with the hook and loop fastener.**



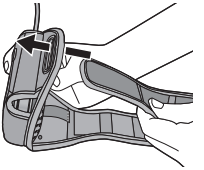
Ⓐ Hook and loop fastener

3 **Adjust the length of the band.**



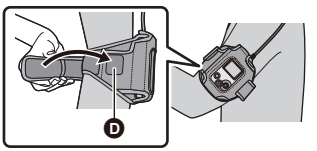
Ⓑ Hard surface of the hook and loop fastener
Ⓒ Hook and loop fastener

4 **Pass the band through the band hole.**



5 **Attach the band to the hard surface of the hook and loop fastener to fasten the band to your arm.**

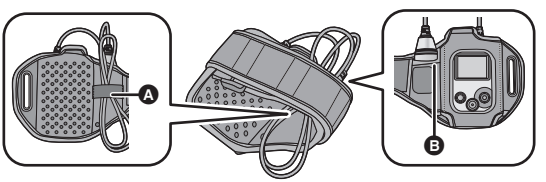
- When fastening the main unit, try not to drop the camera unit to avoid a shock and try not to scratch the lens.



D Hard surface of the hook and loop fastener

■ About the Armband Case

The Armband Case can be used as a portable holder.

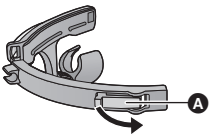


- The camera unit can be stored in the camera pocket B, and the camera/main unit connection cable can be bundled with the band A.
- When fastening to your arm, remove the camera unit from the Armband Case.

- When removing the camera/main unit from the Armband Case, avoid pulling the camera/main unit connection cable.
- Do not forcibly bend or pull the cable. Be extra careful in low temperatures, which cause the cable to become fairly inflexible.
- Optional accessories will be handy in various scenes. (➜ 9)

Assembling the Head Mount

1 **Push down the lock lever of the Head Mount (L) to the UNLOCK side.**

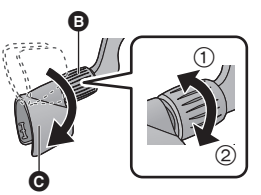


A Lock lever

2 **Attach the Head Mount (R) to the Head Mount (L).**

3 **Loosen the adjustment knob, and change the direction of the camera holder.**

- To loosen the adjustment knob, rotate it towards ①. To tighten the adjustment knob, rotate it towards ②.
- Adjust the direction as shown in the illustration, and tighten the adjustment knob again.

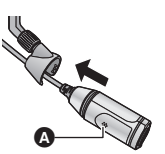


B Adjustment knob
C Camera holder

Attaching the camera unit to the Head Mount to wear

1 **Insert the camera unit until it clicks into place.**

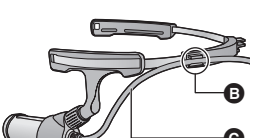
- Insert the camera unit so that the microphone faces inward.



A Microphone

2 **Fit the camera/main unit connection cable in the cable holder.**

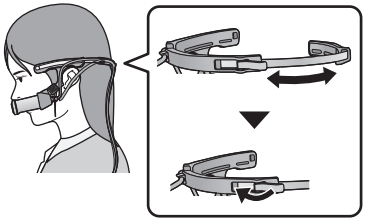
- Loosen the cable to make the shape of the Head Mount.



B Cable holder
C Camera/main unit connection cable

3 Hook the Head Mount to your ears firmly so that the camera unit will be positioned on the left side of your face.

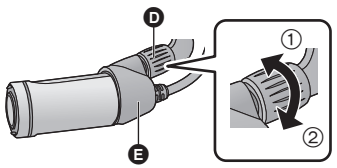
4 Adjust the size of the Head Mount, and push down the lock lever to the LOCK side.



- Adjust by slowly pulling the Head Mount (R) sideways.
- If you adjust in such a way that the camera unit comes into close contact with the cheek, you can record less blurry images.

5 Hold the camera holder, and adjust the direction of the lens.

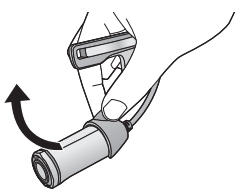
- To loosen the adjustment knob, rotate it towards ①. To tighten the adjustment knob, rotate it towards ②.
- If the direction of the lens cannot be changed, loosen the adjustment knob slightly and tighten it after adjusting the direction of the lens.
- If the camera unit is shaky, tighten the adjustment knob.



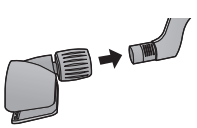
D Adjustment knob
E Camera holder

■ How to remove the camera

Hold the camera holder as shown in the figure, and remove the camera unit in the direction of the arrow.



- Do not touch the lens or pull the camera/main unit connection cable while attaching or removing.
- When adjusting the size of the Head Mount and the tightness of the Headband, do so slowly without applying too much force.
- If the adjustment knob comes off, attach it as indicated in the right figure.



Things to check after putting on this unit

We recommend you make a test recording to check the settings such as the [ANGLE OF VIEW], [LEVEL SHOT], [IMAGE STABILIZATION] and [WHITE BALANCE] before recording.

- Please refer to “Operating Instructions (PDF format)“ for details.

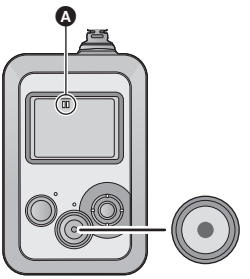
Recording

- **Set this unit to the desired Recording Mode before recording.**

1 Press the recording start/stop button.

- If this unit is set to record a motion picture, recording starts.
- In [PICTURE RECORDING], a still picture will be recorded.
- Once recording starts, the LCD monitor will turn off approximately 30 seconds later. To turn it on again, operate the joystick.

Ⓐ When you begin recording a motion picture, ❚❚ changes to ●.



2 (When recording a motion picture)
Press the recording start/stop button again to pause recording.

Changing the Recording Mode

You can record images with a variety of recording methods by changing the Recording Mode.

1 Press the joystick to select the menu.

[RECORD SETUP] → [RECORDING MODE] → desired recording mode

Recording Mode	icon	Recording method
[NORMAL SHOOTING]		Recording motion pictures.
[SLOW MOTION]		This records motion pictures in slow motion by setting a high frame rate (increasing the number of frames).
[LOOP RECORDING]		No matter how long you record, you can only record motion pictures for the last 1 hour to microSD card.
[PICTURE RECORDING]		Recording still pictures.*

* To set this unit to [PICTURE RECORDING] with the “Image App”, tap the Motion Picture/Still Picture toggle button.

2 Start recording.

- When recording in [SLOW MOTION], use a microSD card with an SD Speed Class Rating of 6 or higher.

Playback using a smartphone

Motion pictures or still pictures stored in this unit are played back with the smartphone.
- For more information, refer to the [Help] in the “Image App” menu.

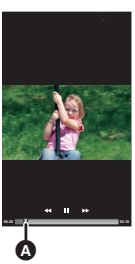
Preparation:
1. **Install the smartphone application “Image App” on your smartphone. (➜ 23)**
2. **Set up a Wi-Fi connection between this unit and the smartphone, and perform remote operation. (➜ 24)**

1 Tap .
- The thumbnails of motion pictures or still pictures recorded on this unit will be displayed.

2 Tap MP4 (JPEG).
- To play back a motion picture, tap MP4 ; to play back a still picture, tap JPEG .

3 Tap the thumbnail of motion picture or still picture you want to play back.
- The playback screen will be displayed.
- If you have tapped a still picture, you can play back the previous or next picture by dragging (swiping) the screen left or right.

4 (For playing back motion pictures) Tap the playback icon on the screen to play back motion pictures.
- Tapping or dragging the slide bar will start playback from the desired position of a motion picture file.



A Slide bar

Wi-Fi® function

To provide a Wi-Fi connection example, these basic operating instructions describe the procedures from setting up a direct connection between this unit and a smartphone to getting them ready for remote operation.

- Please refer to the operating instructions (PDF format) of this unit for details about the setting/ operating of this unit.
- Please refer to the operating instructions of the device in use for details about the setting/ operating of the wireless access point or smartphone.

■ This unit is NFC-compatible

Using the NFC (Near Field Communication) function, you can easily transfer data necessary for a Wi-Fi connection between this unit and the smartphone.
This function can be used with the NFC compatible device with Android™ (OS version 2.3.3 or later). (Except for some models)

Install the “Image App”

About the “Image App”
The “Image App” is an application provided by Panasonic.

	For Android apps	For iOS apps
OS	**Android 2.3.3 or later***	**iOS 5.0 or later***
Installation procedure	**1 Connect your Android device to a network.** **2 Select “Google Play™ Store”.** **3 Enter “Panasonic Image App” into the search box.** **4 Select “Panasonic Image App” and install it.** ● The icon will be added to the menu.	**1 Connect your iOS device to a network.** **2 Select “App Store℠”.** **3 Enter “Panasonic Image App” into the search box.** **4 Select “Panasonic Image App” and install it.** ● The icon will be added to the menu.

* The supported OS versions are current as of April 2014 and subject to change.

- Use the latest version.
- The service may not be able to be used properly depending on the type of smartphone being used. For information on the “Image App”, check the support website below.
  http://panasonic.jp/support/global/cs/e_cam/index.html
  (This Site is English only.)
- When downloading the app on a mobile network, high packet communication fees may be incurred depending on the details of your contract.

Using remote operation with a direct connection ([SMARTPHONE MODE])

■ Preparations before using remote operation

1 Install the smartphone application “Image App” on your smartphone. (➜ 23)

2 Check if the smartphone is an Android (NFC-compatible), Android (non-NFC-compatible), or iOS device.

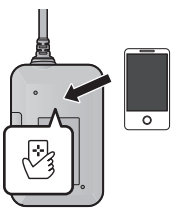
- If your smartphone is NFC-compatible, a message asking you to touch the NFC mark on the device will be displayed when starting up the “Image App”.

■ If the device is Android (NFC-compatible)

- **Set the NFC function of the smartphone to on.**

1 Start up the smartphone application “Image App”.

2 Touch the smartphone on of this unit.



- Touch the NFC mark while a message asking you to touch the NFC mark on the device is displayed on the smartphone screen.
- If this is the first time the smartphone is connecting to this unit, the message is displayed on the screen of this unit. Select [YES], press the joystick, and then touch the smartphone on of this unit again.
- If the unit is not recognised even when touching the smartphone, change positions and try again.
- You cannot set up a connection when recording an image with this unit or the menu screen is displayed.
- When the connection is complete, images of this unit is displayed on the smartphone screen.

■ If the device is Android (non-NFC-compatible) or iOS

- This operation is not possible while this unit is recording.

1 Press the joystick to select the menu.

[Wi-Fi SETUP] → [Wi-Fi MODE]

2 Select the [SMARTPHONE MODE], press the joystick, then start up the [SMARTPHONE MODE].

- A Wi-Fi mode icon ( ) will be displayed on the screen.

3 On the smartphone, select the SSID displayed on this unit from the Wi-Fi setup menu.

4 Enter the Password displayed on this unit’s screen on the smartphone.

Confirming that the Wi-Fi connection is complete
– is displayed on the screen

5 Start up the smartphone application “Image App”.

- When the connection is complete, images of this unit is displayed on the smartphone screen.

If the Wi-Fi connection cannot be established

- Please refer to the operating instruction of the device in use for details about the setting of the wireless access point or smartphone.

Problem	Check points
The Wi-Fi connection is not possible between this unit and a smartphone.	• Make sure the smartphone is properly connected to this unit by checking the Wi-Fi settings of the smartphone. • Make sure the SSID and Password have been correctly input. • Make sure the smartphone is not connected to the wireless access point. If it is connected to the wireless access point, change the Wi-Fi access point using the smartphone's Wi-Fi set up.
It takes long time every time to connect to a smartphone.	• It may take longer time to connect depending on the Wi-Fi connection setting of the smartphone, but it is not a malfunction.
This unit is not displayed in the Wi-Fi setting screen of the smartphone.	• Try switching the on/off of the Wi-Fi function in the Wi-Fi settings of the smartphone.
The Wi-Fi connection is disconnected immediately.	• If there is a setting for avoiding poor connections in the Wi-Fi setting menu of the Android device 4.0 or later version, turn it off.
Cannot be connected using NFC.	• Make sure your smartphone is compatible with NFC. This unit can be used with NFC-compatible terminals via Android (OS version 2.3.3 or later). • Make sure the NFC function of your smartphone is on. • Make sure this unit is turned on. • Some smartphones cannot be easily checked simply by touching. If this unit is not recognised even after touching, change positions and try again by touching slowly. • Touch again if it does not connect after touch. If a connection still cannot be established, shut down the "Image App", turn off this unit and try to establish a connection again. • If the amount of time this unit is in contact with the smartphone is too short, this unit may not recognise the smartphone. Touch and hold the smartphone.

Reset Wi-Fi settings

You can change the Wi-Fi setting back to the default condition. The "LUMIX CLUB" Login ID can also be deleted.

1 Press the joystick to select the menu.

[Wi-Fi SETUP] → [RESET Wi-Fi SETTINGS] → [YES]

2 (To delete the Login ID of the "LUMIX CLUB")
Select [YES], then press the joystick.

Troubleshooting

■ It is not a malfunction in following cases

The lens or LCD monitor fog up.	● This is due to condensation. It is not a malfunction. Please refer to page 6.
The alert sound and shutter sound are low.	● This is for ensuring the waterproof performance of this unit, and not a malfunction. Opening and closing the side cover will restore the original volume.

Problem	Check points
This unit cannot be turned on. **This unit does not stay on long enough.** **Battery runs down quickly.**	● Charge the battery again to ensure it is sufficiently charged. (➜ 11) ● In cold places, the battery using time becomes shorter. ● If the operating time is very short even after the battery has been recharged sufficiently, the battery has worn out. Consult with your dealer.
The power lamp flashes for approximately 5 seconds, and the unit turns off approximately 30 seconds later.	● The temperature has become high. Please wait until the temperature of this unit decreases.
Colour balance of images is strange when recording in a place such as a gymnasium.	● In a place with multiple light sources, such as a gymnasium or a hall, set the White Balance setting to (Indoor 2). If you cannot record clearly with the (Indoor 2), set it with [CUSTOM].
Recorded motion pictures flicker. **Horizontal lines appear in recorded movies.**	● If you record an image with [1280×720/100fps] or [848×480/200fps] in [SLOW MOTION], flickering or horizontal lines may appear under fluorescent lighting.

Please refer to “Operating Instructions (PDF format)“ for details.

Requests when disposing of this unit

When disposing of your used products, remove the battery built into this unit after performing [RESET Wi-Fi SETTINGS] (➜ 25), and please cooperate in recycling of the battery. Please refer to page 28 about how to remove the battery.

- Please make sure that the battery is disposed of at an officially assigned location, if there is one in your country.

Do not disassemble this unit other than when disposing of this unit.

This is the rechargeable battery for this unit.
Do not use other than with this unit.
Do not charge the rechargeable battery when it has been removed.

- Do not place in fire or heat it.
- Do not puncture with nails, subject it to impact, disassemble or modify it.
- Do not touch metal to the + and − terminals.
- Do not store or carry together with necklaces or hairpins, etc.
- Do not heat in microwaves or ovens, etc.
- Do not charge, use or leave in hot places such as next to fires or in extremely hot weather.
- Do not put into water.

This may cause leaking, overheating, fire or rupture.

- If a leak should occur, by no means touch the liquid with bare hands.
  If the liquid gets on the body or clothes, wash well with water. If the liquid gets into your eyes, there is a danger of blindness. Do not rub the eyes; after washing immediately with clean water, consult your physician.

Keep removed screws etc. out of the reach of small children.
If accidentally ingested there will be adverse physical effects.

- Should you suspect that such an object has been ingested, consult your physician immediately.

Battery used for this unit

Name:	Lithium ion (Li-ion) rechargeable battery
Nominal voltage:	DC 3.7 V

How to remove the battery

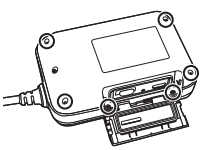
When disposing of your used products, perform [RESET Wi-Fi SETTINGS] to delete personal information from this unit.

This figure describes the disposal of this unit, it is not instruction for repair. If disassembled, repair is not possible.

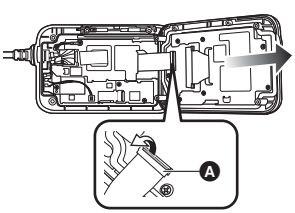
- Disassemble after the battery runs out.
- If it cannot be removed smoothly, contact Panasonic's Service Centre.
- Keep disassembled parts out of reach of children.

1 Open the side cover, and remove all of the 6 screws indicated in the figure below.

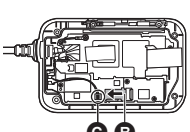
- Use a cross-slot screwdriver (commercially available).



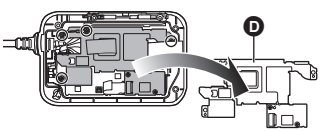
2 Remove the connector Ⓐ of the flexible circuit board, and remove the circuit board on the front side (button side) of this unit.



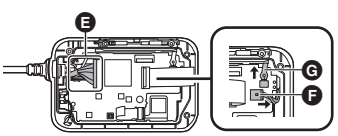
3 Pull out the flexible circuit board Ⓑ, and pull out the speaker connector Ⓒ upwards.



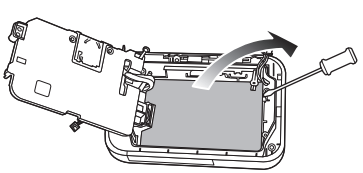
4 Remove the 4 screws indicated in the figure below, and remove the heatsink Ⓓ.



5 Remove the connector Ⓔ of the camera unit, the built-in battery connector Ⓕ, and the NFC flexible circuit board Ⓖ, and lift up the circuit board.



6 Remove the battery by using a screwdriver.



Regarding the handling of used batteries

- Insulate the terminals with cellophane tape or similar.
- Do not disassemble.

Specifications

Wearable camera
Information for your safety

Power source:	3.7 V (When using battery)/5.0 V (When using USB)
Power consumption:	Recording; 4.3 W Charging; 2.3 W

Motion picture recording format:
MPEG-4 AVC file format compliant (.MP4)
- For picture size, recordable time and transfer rate of a motion picture, refer to the operating instructions (PDF format).

Motion picture compression:
MPEG-4 AVC/H.264
Audio compression:
AAC
Still picture recording format:
JPEG (Design rule for Camera File system, based on Exif 2.2 standard)
- For picture size of a still picture and number of recordable pictures, refer to the operating instructions (PDF format).

Recording media:
microSD card (512 MB/1 GB/2 GB),
microSDHC card (4 GB/8 GB/16 GB/32 GB)
Image sensor:
1/2.3 type (1/2.3″) 1MOS image sensor
Total; Approx. 12760 K
Effective pixels;
Motion picture; Approx. 9030 K (16:9)*1
Still picture; Approx. 8340 K (16:9)*2
Lens:
F2.8
Focal length; 3.4 mm
Angle of view; Up to approx.160 ° *1
Minimum focus distance; Approx. 50 cm

*1 When [ANGLE OF VIEW] is set to [WIDE], [PIXELS / FRAME RATE] is set to [1920×1080/25p] and [RECORDING MODE] is set to [NORMAL SHOOTING]
*2 When [ANGLE OF VIEW] is set to [WIDE] and [RECORDING MODE] is set to [PICTURE RECORDING]

Shutter speed:
Motion picture; 1/25 to 1/12000
Still picture; 1/6 to 1/12000
Image stabilizer function:
Electronic image stabilizer
Level shot function:
[STRONG]/[NORMAL]/[OFF]
Monitor:
3.7 cm (1.5″) LCD monitor (Approx. 115 K dots)
Microphone:
Monaural
Minimum required illumination:
Approx. 6 lx
Approx. 1 lx with the Colour Night View function
USB:
Reader function
microSD card; Read only (No copyright protection support)
Battery charging function (Charges from USB terminal when the main unit is off)
Hi-Speed USB (USB 2.0), USB terminal Type micro-B
Dimensions:
Camera unit;
26.5 mm (W)×26.5 mm (H)×68.5 mm (D)
Main unit;
59.5 mm (W)×94.0 mm (H)×26.7 mm (D)
Mass:
Camera unit;
Approx. 31 g
[Excluding the cable portion]
Main unit;
Approx. 128 g
Mass in operation:
Approx. 185 g
[with a microSD card (optional)]
Operating temperature:
0 °C to 40 °C

Operating humidity:
10%RH to 80%RH
Waterproof/Dustproof performance:
Equivalent to IEC 60529 “IP58”
Battery operation time:
See page 12

Wireless transmitter:
Compliance standard; IEEE802.11b/g/n
Frequency range used;
Central frequency 2412 MHz to 2462 MHz [11ch]
Encryption method; Wi-Fi compliant WPA™/WPA2™/WEP
Access method; Infrastructure mode
NFC:
Compliance standard; ISO/IEC 18092 NFC-F (Passive Mode)

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